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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/583,951

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EXAMINER

RICKMAN, HOLLY C

ART UNIT

PAPER NUMBER

1794

NOTIFICATION DATE

DELIVERY MODE

01/04/2010

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/583,951	Applicant(s) MAEDA ET AL.	
	Examiner Holly Rickman	Art Unit 1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 September 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-20 is/are pending in the application.
- 4a) Of the above claim(s) 9-17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-8,18 and 19 is/are rejected.
- 7) ☒ Claim(s) 20 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 September 2009 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Status Identifiers

1. Claims 9-17 were withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected method. The status identifiers for these claims must be changed to read “(Withdrawn)” in response to this action in order to be considered responsive.

Claim Rejections - 35 USC § 112

2. The rejection of claims 2 and 6-8 under 35 U.S.C. 112, second paragraph, are withdrawn in view of Applicant’s amendments.

Claim Rejections - 35 USC § 102

3. The rejection of claims 1, 3-6 and 18-19 under 35 U.S.C. 102(e) as being anticipated by Sakawaki et al. (US 7470474) is withdrawn in view of Applicant’s amendments.

4. The rejection of claims 1, 3-4 and 18-19 under 35 U.S.C. 102(e) as being anticipated by Wu et al. (US 7192664) is withdrawn in view of Applicant’s amendments.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are

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such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 1, 3-4, and 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wu et al. (US 7192664).

Wu et al. disclose a perpendicular magnetic recording medium having a substrate, at least one undercoating layer, and a granular magnetic layer having Co-alloy magnetic grains separated by oxide grain boundaries formed from TiO and TiO₂ wherein the oxide content is 6 mol% for example with a maximum amount of 15 mol% (see col 6, lines 55-60; col. 5, lines 38-57; col. 4, lines 64-67). The reference specifically states in col. 6, lines 55-60 that the disclosure of TiO₂ at the grain boundaries of the magnetic layer includes TiO. Thus, it is clear that Wu envisaged a grain boundary with some mixture of TiO and TiO₂ even though the specific proportions of the two compounds are not explicit.

It would have been well within the level of ordinary skill in the art at the time of invention to determine the optimal ratio of TiO₂, TiO and other non-stoichiometric Ti oxides to use in the grain boundary.

With regard to claim 3, Wu teaches the use of a CoPt alloy with the addition of an element such as Cr. The group of suitable additive elements is small enough that one of ordinary skill in the art would have immediately envisaged an embodiment using CoPtCr (see columns 7-8, claims 1-3).

With regard to claim 4, Wu discloses an intermediate layer corresponding to the claimed undercoating layer formed from Ru or Ru alloys (col. 6, lines 26-29). The group of suitable intermediate layer materials is small enough that one of ordinary skill in the art would have immediately envisaged an embodiment using a Ru-containing intermediate layer.

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With regard to claims 18-19, the reference teaches use of the aforementioned recording medium in a recording apparatus using a single pole head (col.. 4, lines 64-67).

7. Claims 5-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wu et al. (US 7192664) in view of Sakawaki et al. (US 7470474).

Wu et al. disclose all of the features of the claims, as detailed above, except for the use of a Ru undercoating layer containing TiO or Ti₂O₃ wherein TiO₂ is present in an amount of less than or equal to 90 mol%.

Sakawaki teaches the equivalence of TiO and TiO₂ for use as a grain segregating material in the magnetic layer taught therein. The reference discloses the use of oxide grain segregating materials in the Ru-containing undercoating layer taught therein. The reference discloses TiO₂ as a specific example of this.

It would have been obvious to one of ordinary skill in the art to add TiO and/or TiO₂ as a grain boundary material in the Ru layer taught by Wu et al. in view of Sakawaki's teaching. Optimization of the specific contents (mol percentages) of each component would have been well within the purview of one of ordinary skill in the art at the time of invention.

Allowable Subject Matter

8. Claim 20 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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Applicant has provided evidence of unexpectedly high S/N ratio associated with claim 20. As shown in Figure 7, the endpoints of the claimed range of 40-60 mol% TiO₂ show S/N values that are unexpectedly increased as compared to values above and below this range.

Response to Arguments

9. Applicant's arguments filed 9/25/09 have been fully considered but they are not persuasive.

Applicant argues that the closest prior art to Wu et al. has been overcome because the claims require a grain boundary field containing TiO₂ in addition to TiO or Ti₂O₃ wherein the TiO₂ is present in an amount of 90 mol% or less. An amount of greater than 0 mol% for the TiO₂ is implied because the claim requires the presence of TiO₂. Applicant maintains that the data set forth in the Figures 6-9 establishes the presence of unexpectedly high SNR associated with the claimed TiO₂ amount.

The examiner respectfully disagrees because the data in the figures is not commensurate in scope with the claimed invention. Of all of figures 6-9, only Fig. 7 shows SNR associated with a combination of oxides as required by the claims. However, this figure does not show data for the entirety of the claimed range (i.e., greater than 0 but less than or equal to 90 mol%). There is no data shown below 10 mol% of TiO₂. Thus, unexpected results cannot be evaluated across this range.

As noted above, unexpected results are shown for the narrower range of 40-60 mol% TiO₂ in Figure 7.

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Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Holly Rickman whose telephone number is (571) 272-1514. The examiner can normally be reached on Monday-Friday 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Ruthkosky can be reached on (571) 272-1291. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Holly Rickman/
Primary Examiner
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